DRINKING WATER SURVEILLANCE PROGRAM

SOUTH PEEL (LAKEVIEW) WATER SUPPLY SYSTEM

ANNUAL REPORT 1990

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

SOUTH PEEL (LAKEVIEW) WATER SUPPLY SYSTEM
1990 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

The South Peel (Lakeview) water treatment plant is a conventional treatment plant which treats water from Lake Ontario. The process consists of coagulation, flocculation, sedimentation, filtration, taste and odour control, fluoridation and disinfection. Ammonia is added to convert the disinfectant to a combined chlorine residual and sulphur dioxide is used to remove any excess chlorine. This plant has a rated capacity of 437.0 x 1000 m^3/day. The South Peel (Lakeview) water treatment plant together with the Lorne Park facility serves a population of approximately 700,000.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols twice a year in the spring and fall.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The South Peel (Lakeview) water treatment plant, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

TABLE A

DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE RAW TESTS	POSITIVE	%POSITIVE	TREATED TESTS	POSITIVE	%POSITIVE	SITE 1 TESTS	POSITIVE	%POSITIVE	SITE 2 TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	18	16	88	6	1	16	4	1	25	4	4	100
CHEMISTRY (FLD)	18	18	100	36	35	97	72	72	100	48	48	100
CHEMISTRY (LAB)	126	106	84	132	102	77	228	202	88	151	137	90
METALS	144	62	43	144	50	34	276	124	44	184	74	40
CHLOROAROMATICS	84	0	0	84	1	1	70	0	0	56	1	1
CHLOROPHENOLS	12	0	0	12	0	0	.	.	.	.	.	.
PAH	101	0	0	101	0	0	17	0	0	17	0	0
PESTICIDES & PCB	191	0	0	204	0	0	105	0	0	85	0	0
PHENOLICS	6	1	16	6	2	33	.	.	.	.	.	.
SPECIFIC PESTICIDES	57	0	0	57	0	0	5	0	0	4	0	0
VOLATILES	174	0	0	174	24	13	145	20	13	116	18	15
TOTAL	938	205		963	217		922	419		665	282	

DRINKING WATER SURVEILLANCE PROGRAM

SOUTH PEEL (LAKEVIEW) WATER SUPPLY SYSTEM
1990 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the South Peel (Lakeview) water treatment plant in the summer of 1984 and was used in the development of the program. Previous annual reports have been published for 1986, 1987, 1988 and 1989.

PLANT DESCRIPTION

The South Peel (Lakeview) water supply system is a conventional treatment plant which treats water from Lake Ontario. The process consists of coagulation, flocculation, sedimentation, filtration, taste and odour control, fluoridation and disinfection. Ammonia is added to convert the disinfectant to a combined chlorine residual and sulphur dioxide is used to remove any excess chlorine. This plant has a rated capacity of 437.0 x 1000 m^3/day. The South Peel (Lakeview) water treatment plant together with the Lorne Park facility serves a population of approximately 700,000.

The sample day flows ranged from 209.000 x 1000 m^3/day to 391.000 x 1000 m^3/day.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

At all distribution system locations two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service

connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals, due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples therefore, were General Chemistry and Metals. The free flow sample represented fresh water from the distribution main, since the sample tap was flushed for five minutes prior to sampling.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

Stringent DWSP sampling protocols were followed to ensure that all samples were taken in a uniform manner (see Appendix B).

Plant operating personnel routinely analyze parameters for process control (Table 2).

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols twice a year in the spring and fall. Laboratory analyses were conducted at the Ministry of the Environment facilities in Rexdale, Ontario.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary break-down of the number of water samples analyzed by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment laboratory staff and is quantifiable. Trace (<T) denotes that the

level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 5 and 6. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- **THE TREATED AND DISTRIBUTED WATER;**
- **ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES; AND**
- **POSITIVE ORGANIC PARAMETERS DETECTED.**

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples.

Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were reported above the guideline.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance

organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of the delivered water may increase in the distribution system due to the warming effect of the soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Maximum Desirable Concentration of 15°C in 2 of 16 treated and distributed water samples with a maximum reported value of 20.0°C.

CHEMISTRY (LAB)

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and would possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Aesthetic or Recommended Operational Guideline of 80-100 mg/L in all 16 treated and distributed water samples with a maximum reported value of 149.1 mg/L.

Total ammonium exceeded the European Economic Community Aesthetic Guideline Level of 0.05 mg/L in 9 of 16 treated and distributed water samples with a maximum reported value of 0.22 mg/L. Anhydrous ammonia is added within the plant process to convert the disinfectant from a free chlorine residual to a longer lasting combined chlorine residual.

METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to indicate the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant, to avoid problems in the distribution system.

Aluminum exceeded the ODWO Aesthetic or Recommended Operational Guideline of 100 ug/L in 5 of 16 treated and distributed water samples with a maximum reported value of 230.0 ug/L.

ORGANIC

CHLOROAROMATICS

Hexachloroethane was reported at positive levels in 2 of 16 treated and distributed water samples with a maximum reported value of 46 ng/L. The United States Environmental Protection Agency has an

Ambient Water Quality Criteria of 1900 ng/L.

The results of the other parameters in the chloroaromatic scan showed that none were detected.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

POLYAROMATIC HYDROCARBONS (PAH)

The results of the PAH scan showed that none were detected above trace levels in the treated or distributed water samples.

PESTICIDES & PCB

The results of the PCB scan showed that none were detected.

The results of the regular pesticide scan showed that none were detected above trace levels.

PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs recommend, as an operational guideline, that phenolic substances in drinking water not exceed 2.0 ug/L. This limit has been set primarily to prevent undesirable taste and odours, particularly in chlorinated water.

Phenolics exceeded the ODWO Aesthetic or Recommended Operational Guideline of 2 ug/L in 1 of 6 treated water samples with a reported value of 2.8 ug/L.

SPECIFIC PESTICIDES

The results of the specific pesticides scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. M-xylene and O-xylene were found at positive levels in 1 of the 15 treated and distributed water samples with reported values of 1.3 and 0.75 ug/L respectively. The ODWO Aesthetic Objective for total xylenes is 300 ug/l.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and

dichlorobromomethane; bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THMs results are discussed.

Total THMs were found at positive levels in the 15 treated and distributed water samples analyzed with a maximum level of 45.8 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

By using ammonia to form a combined chlorine residual, the average trihalomethane levels in this supply are lower than would normally be expected for this raw water source.

CONCLUSIONS

The South Peel (Lakeview) water treatment plant, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

No known health related guidelines were exceeded.

FIGURE 1

SOUTH PEEL (LAKEVIEW) WATER TREATMENT PLANT

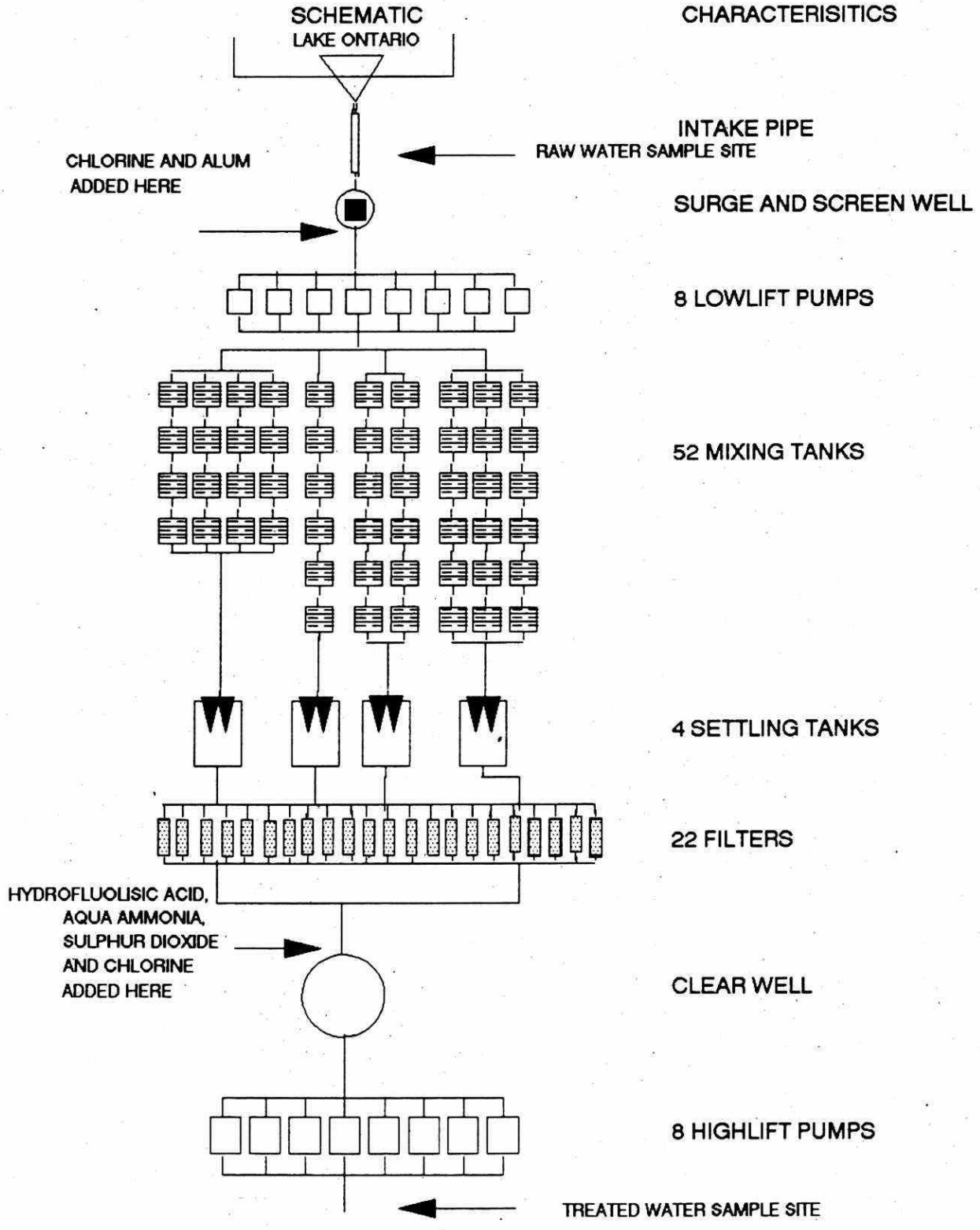

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM

PLANT GENERAL REPORT

WORKS #:	210000568
PLANT NAME:	SOUTH PEEL (LAKEVIEW) WSS
DISTRICT:	SOUTH PEEL
REGION:	CENTRAL
DISTRICT OFFICER:	J. BUDZ
UTM #:	176163004824350
PLANT SUPERINTENDENT:	R. TUFTS
ADDRESS:	920 EAST AVENUE MISSISSAUGA, ONTARIO L5E 1W6 (416)278-8471
MUNICIPALITY:	PEEL
AUTHORITY:	PROVINCIAL

PLANT INFORMATION

PLANT VOLUME:	-	(X 1000 M3)
DESIGN CAPACITY:	-	(X 1000 M3/DAY)
RATED CAPACITY:	437.000	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
BRAMPTON	254,000
MISSISSAUGA	446,000

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

PARAMETER	LOCATION	FREQUENCY
COMBINED CHLORINE RESIDUAL	AFTER FILTERS	EVERY 2 HOURS
	TREATED WATER	EVERY 2 HOURS
FREE CHLORINE RESIDUAL	AFTER FILTERS	EVERY 2 HOURS
	TREATED WATER	EVERY 2 HOURS
TOTAL CHLORINE RESIDUAL	AFTER FILTERS	EVERY 2 HOURS
	TREATED WATER	EVERY 2 HOURS
FLUORIDE	RAW WATER IN LAB	24HR
	TREATED WATER	CONTINUOUS
AMMONIA TEST	RAW WATER	EVERY 2 HOURS
	TREATED WATER	EVERY 2 HOURS
PH	AFTER DISINFECTION	CONTINUOUS
	RAW WATER	EVERY 2 HOURS
	TREATED WATER	6HRL
TEMPERATURE	RAW WATER	CONTINUOUS
TURBIDITY	TREATED WATER IN LAB	CONTINUOUS
	SETTLED WATER IN LAB	CONTINUOUS
	RAW WATER IN LAB	CONTINUOUS
	RAW WATER	EVERY 2 HOURS
	AFTER SETTLING TANKS	2 HR
	TREATED WATER	2 HR

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS SAMPLE DAY CONDITIONS FOR 1990

			TREATMENT CHEMICAL (MG/L)				
			PRE CHLORINATION	COAGULATION	FLUORIDATION	TASTE & ODOUR	DECHLORINATION
			CHLORINE	ALUM LIQUID	HYDROFLUOSILICIC ACID	AMMONIUM ANHYDROUS	SULPHUR DIOXIDE
DATE	DELAY * TIME(HRS)	FLOW (1000M3)					
JAN 04	3.05	209.000	2.56	5.00	1.31	.19	.23
MAR 07	3.05	209.116	3.07	5.00	1.06	.17	.22
MAY 09	2.34	272.760	3.60	7.57	1.23	.13	.07
JUL 05	2.17	391.000	3.94	3.00	1.02	.21	.30
SEP 06	3.47	245.484	2.87	1.50	1.08	.15	.19
NOV 07	3.08	218.208	2.18	4.67	1.23	.25	.17

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1			SITE 2		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
BACTERIOLOGICAL												
FECAL COLIFORM MF	6	5	0	.	.	.	.	.	.	.	.	.
STANDRD PLATE CNT MF	.	.	.	6	1	0	4	1	0	4	4	0
TOTAL COLIFORM MF	6	5	0	.	.	.	.	.	.	.	.	.
T COLIFORM BCKGRD MF	6	6	0	.	.	.	.	.	.	.	.	.
*TOTAL SCAN BACTERIOLOGICAL	18	16	0	6	1	0	4	1	0	4	4	0
CHEMISTRY (FLD)												
FLD CHLORINE (COMB)	.	.	.	6	6	0	12	12	0	8	8	0
FLD CHLORINE FREE	.	.	.	6	5	0	12	12	0	8	8	0
FLD CHLORINE (TOTAL)	.	.	.	6	6	0	12	12	0	8	8	0
FLD PH	6	6	0	6	6	0	12	12	0	8	8	0
FLD TEMPERATURE	6	6	0	6	6	0	12	12	0	8	8	0
FLD TURBIDITY	6	6	0	6	6	0	12	12	0	8	8	0
*TOTAL SCAN CHEMISTRY (FLD)	18	18	0	36	35	0	72	72	0	48	48	0
CHEMISTRY (LAB)												
ALKALINITY	5	5	0	6	6	0	12	12	0	8	8	0
CALCIUM	6	6	0	6	6	0	12	12	0	8	8	0
CYANIDE	6	0	0	6	0	0	.	.	.	.	.	.
CHLORIDE	6	6	0	6	6	0	12	12	0	8	8	0
COLOUR	6	0	6	6	0	5	12	0	12	8	0	8
CONDUCTIVITY	5	5	0	6	6	0	12	12	0	8	8	0
DISS ORG CARBON	6	6	0	6	6	0	12	12	0	8	8	0
FLUORIDE	6	6	0	6	6	0	12	12	0	8	8	0
HARDNESS	6	6	0	6	6	0	12	12	0	8	8	0
IONCAL	6	5	0	6	6	0	12	12	0	8	8	0
LANGELIERS INDEX	5	5	0	6	6	0	12	12	0	7	7	0
MAGNESIUM	6	6	0	6	6	0	12	12	0	8	8	0
SODIUM	6	6	0	6	6	0	12	12	0	8	8	0
AMMONIUM TOTAL	6	5	0	6	5	0	12	10	2	8	6	1
NITRITE	6	5	1	6	0	6	12	1	10	8	4	4
TOTAL NITRATES	6	6	0	6	6	0	12	12	0	8	8	0
NITROGEN TOT KJELD	5	5	0	6	6	0	12	12	0	8	8	0
PH	5	5	0	6	6	0	12	12	0	8	8	0
PHOSPHORUS FIL REACT	6	1	5	6	1	4	.	.	.	.	.	.
PHOSPHORUS TOTAL	5	5	0	6	0	5	.	.	.	.	.	.
SULPHATE	6	6	0	6	6	0	12	12	0	8	8	0
TURBIDITY	6	6	0	6	6	0	12	11	1	8	8	0
*TOTAL SCAN CHEMISTRY (LAB)	126	106	12	132	102	20	228	202	25	151	137	13

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1			SITE 2		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS												
SILVER	6	0	0	6	0	1	12	0	1	8	0	2
ALUMINUM	6	6	0	6	6	0	12	12	0	8	8	0
ARSENIC	6	0	6	6	0	6	12	0	11	8	0	8
BARIUM	6	6	0	6	6	0	12	12	0	8	8	0
BORON	6	6	0	6	6	0	12	12	0	8	8	0
BERYLLIUM	6	0	0	6	0	0	12	0	0	8	0	0
CADMIUM	6	0	1	6	0	1	12	0	3	8	0	2
COBALT	6	0	6	6	0	6	12	0	11	8	0	8
CHROMIUM	6	0	6	6	0	5	12	0	11	8	0	8
COPPER	6	6	0	6	1	5	12	12	0	8	5	3
IRON	6	4	2	6	0	3	12	0	4	8	0	2
MERCURY	6	0	2	6	0	1	.	.	.	.	.	.
MANGANESE	6	6	0	6	5	1	12	12	0	8	8	0
MOLYBDENUM	6	6	0	6	6	0	12	12	0	8	8	0
NICKEL	6	0	6	6	0	5	12	0	10	8	0	8
LEAD	6	5	1	6	0	4	12	9	3	8	5	2
ANTIMONY	6	5	1	6	5	1	12	12	0	8	6	2
SELENIUM	6	0	1	6	0	3	12	0	2	8	0	2
STRONTIUM	6	6	0	6	6	0	12	12	0	8	8	0
TITANIUM	6	0	6	6	1	5	12	2	10	8	0	8
THALLIUM	6	0	0	6	0	0	12	0	0	8	0	0
URANIUM	6	0	6	6	0	6	12	1	11	8	0	8
VANADIUM	6	0	6	6	3	3	12	4	8	8	3	5
ZINC	6	6	0	6	5	1	12	12	0	8	7	1
*TOTAL SCAN METALS	144	62	50	144	50	57	276	124	85	184	74	69
*TOTAL GROUP INORGANIC & PHYSICAL	288	186	62	312	187	77	576	398	110	383	259	82
COBALT 60	1	0	0	1	0	0	.	.	.	.	.	.
CESIUM 134	1	0	0	1	0	0	.	.	.	.	.	.
CESIUM 137	1	0	0	1	0	0	.	.	.	.	.	.
GROSS ALPHA COUNT	1	0	0	1	0	0	.	.	.	.	.	.
GROSS BETA COUNT	1	1	0	1	1	0	.	.	.	.	.	.
TRITIUM	1	1	0	1	1	0	.	.	.	.	.	.
IODINE 131	1	0	0	1	0	0	.	.	.	.	.	.
*TOTAL SCAN	7	2	0	7	2	0	0	0	0	0	0	0
CHLOROAROMATICS												
HEXACHLOROBUTADIENE	6	0	0	6	0	0	5	0	0	4	0	0
123 TRICHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0
1234 T-CHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0
1235 T-CHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0
124 TRICHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0
1245 T-CHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0
135 TRICHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1			SITE 2		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
HCB	6	0	0	6	0	0	5	0	0	4	0	0
HEXACHLOROETHANE	6	0	0	6	1	0	5	0	0	4	1	0
OCTACHLOROSTYRENE	6	0	0	6	0	0	5	0	0	4	0	0
PENTACHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0
236 TRICHLOROTOLUENE	6	0	0	6	0	0	5	0	0	4	0	0
245 TRICHLOROTOLUENE	6	0	0	6	0	0	5	0	0	4	0	0
26A TRICHLOROTOLUENE	6	0	0	6	0	0	5	0	0	4	0	0
*TOTAL SCAN CHLOROAROMATICS	84	0	0	84	1	0	70	0	0	56	1	0
CHLOROPHENOLS												
234 TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
2345 T-CHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
2356 T-CHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
245-TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
246-TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
PENTACHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
*TOTAL SCAN CHLOROPHENOLS	12	0	0	12	0	0	0	0	0	0	0	0
PAH												
PHENANTHRENE	6	0	0	6	0	0	1	0	0	1	0	0
ANTHRACENE	6	0	0	6	0	0	1	0	0	1	0	0
FLUORANTHENE	6	0	0	6	0	0	1	0	0	1	0	0
PYRENE	6	0	0	6	0	0	1	0	0	1	0	0
BENZO(A)ANTHRACENE	6	0	0	6	0	0	1	0	0	1	0	0
CHRYSENE	6	0	0	6	0	0	1	0	0	1	0	0
DIMETH. BENZ(A)ANTHR	5	0	0	5	0	0	1	0	0	1	0	0
BENZO(E) PYRENE	6	0	0	6	0	0	1	0	0	1	0	0
BENZO(B) FLUORANTHEN	6	0	0	6	0	0	1	0	0	1	0	0
PERYLENE	6	0	0	6	0	0	1	0	0	1	0	0
BENZO(K) FLUORANTHEN	6	0	0	6	0	1	1	0	0	1	0	0
BENZO(A) PYRENE	6	0	0	6	0	0	1	0	0	1	0	0
BENZO(G,H,I) PERYLEN	6	0	0	6	0	0	1	0	0	1	0	0
DIBENZO(A,H) ANTHRAC	6	0	0	6	0	0	1	0	0	1	0	0
INDENO(1,2,3-C,D) PY	6	0	0	6	0	0	1	0	0	1	0	0
BENZO(B) CHRYSENE	6	0	0	6	0	0	1	0	0	1	0	0
CORONENE	6	0	0	6	0	0	1	0	0	1	0	0
*TOTAL SCAN PAH	101	0	0	101	0	1	17	0	0	17	0	0
PESTICIDES & PCB												
ALDRIN	6	0	0	6	0	0	5	0	0	4	0	0
ALPHA BHC	6	0	6	6	0	6	5	0	4	4	0	4
BETA BHC	6	0	0	6	0	0	5	0	0	4	0	0
LINDANE	6	0	2	6	0	1	5	0	0	4	0	1
ALPHA CHLORDANE	6	0	0	6	0	0	5	0	0	4	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1			SITE 2		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
GAMMA CHLORDANE	6	0	0	6	0	0	5	0	0	4	0	0
DIELDRIN	6	0	0	6	0	0	5	0	0	4	0	0
METHOXYCHLOR	6	0	0	6	0	0	5	0	0	4	0	0
ENDOSULFAN 1	6	0	0	6	0	0	5	0	0	4	0	0
ENDOSULFAN II	6	0	0	6	0	0	5	0	0	4	0	0
ENDRIN	6	0	0	6	0	0	5	0	0	4	0	0
ENDOSULFAN SULPHATE	6	0	0	6	0	0	5	0	0	4	0	0
HEPTACHLOR EPOXIDE	6	0	0	6	0	0	5	0	0	4	0	0
HEPTACHLOR	6	0	0	6	0	0	5	0	0	4	0	0
MIREX	6	0	0	6	0	0	5	0	0	4	0	0
OXYCHLORDANE	6	0	0	6	0	0	5	0	0	4	0	0
OPDDT	6	0	0	6	0	0	5	0	0	4	0	0
PCB	6	0	0	6	0	0	5	0	0	4	0	0
DDD	6	0	0	6	0	0	5	0	0	4	0	0
PPDDE	6	0	0	6	0	0	5	0	0	4	0	0
PPDDT	6	0	0	6	0	0	5	0	0	4	0	0
AMETRINE	5	0	0	6	0	0	.	.	.	.	.	.
ATRAZINE	5	0	2	6	0	2	.	.	.	.	.	.
ATRATONE	5	0	0	6	0	0	.	.	.	.	.	.
CYANAZINE (BLADEX)	5	0	0	6	0	0	.	.	.	.	.	.
DESETHYLATRAZINE	5	0	0	6	0	0	.	.	.	.	.	.
D-ETHYL SIMAZINE	4	0	0	5	0	0	.	.	.	.	.	.
PROMETONE	5	0	0	6	0	0	.	.	.	.	.	.
PROPAZINE	5	0	0	6	0	0	.	.	.	.	.	.
PROMETRYNE	5	0	0	6	0	0	.	.	.	.	.	.
METRIBUZIN (SENCOR)	5	0	0	6	0	0	.	.	.	.	.	.
SIMAZINE	5	0	0	6	0	0	.	.	.	.	.	.
ALACHLOR (LASSO)	5	0	0	6	0	0	.	.	.	.	.	.
METOLACHLOR	5	0	0	6	0	0	.	.	.	.	.	.
HEXACLCYCLOPENTADIEN	1	0	0	1	0	0	0	0	0	1	0	0
*TOTAL SCAN PESTICIDES & PCB	191	0	10	204	0	9	105	0	4	85	0	5
PHENOLICS												
PHENOLICS	6	1	3	6	2	3	.	.	.	.	.	.
*TOTAL SCAN PHENOLICS	6	1	3	6	2	3	0	0	0	0	0	0
SPECIFIC PESTICIDES												
TOXAPHENE	6	0	0	6	0	0	5	0	0	4	0	0
2,4,5-T	2	0	0	2	0	0	.	.	.	.	.	.
2,4-D	2	0	0	2	0	0	.	.	.	.	.	.
2,4-DB	2	0	0	2	0	0	.	.	.	.	.	.
2,4 D PROPIONIC ACID	2	0	0	2	0	0	.	.	.	.	.	.
DICAMBA	1	0	0	1	0	0	.	.	.	.	.	.
PICHLORAM	0	0	0	0	0	0	.	.	.	.	.	.
SILVEX	2	0	0	2	0	0	.	.	.	.	.	.
DIAZINON	2	0	0	2	0	0	.	.	.	.	.	.
DICHLOROVOS	2	0	0	2	0	0	.	.	.	.	.	.
CHLORPYRIFOS	2	0	0	2	0	0	.	.	.	.	.	.
ETHION	2	0	0	2	0	0	.	.	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1			SITE 2		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
AZINPHOS-METHYL	0	0	0	0	0	0	.	.	.	.	.	.
MALATHION	2	0	0	2	0	0	.	.	.	.	.	.
MEVINPHOS	2	0	0	2	0	0	.	.	.	.	.	.
METHYL PARATHION	2	0	0	2	0	0	.	.	.	.	.	.
METHYLTRITHION	2	0	0	2	0	0	.	.	.	.	.	.
PARATHION	2	0	0	2	0	0	.	.	.	.	.	.
PHORATE	2	0	0	2	0	0	.	.	.	.	.	.
RELDAN	2	0	0	2	0	0	.	.	.	.	.	.
RONNEL	2	0	0	2	0	0	.	.	.	.	.	.
AMINOCARB	0	0	0	0	0	0	.	.	.	.	.	.
BENONYL	0	0	0	0	0	0	.	.	.	.	.	.
BUX	0	0	0	0	0	0	.	.	.	.	.	.
CARBOFURAN	2	0	0	2	0	0	.	.	.	.	.	.
CICP	2	0	0	2	0	0	.	.	.	.	.	.
DIALLATE	2	0	0	2	0	0	.	.	.	.	.	.
EPTAM	2	0	0	2	0	0	.	.	.	.	.	.
IPC	2	0	0	2	0	0	.	.	.	.	.	.
PROPOXUR	2	0	0	2	0	0	.	.	.	.	.	.
CARBARYL	2	0	0	2	0	0	.	.	.	.	.	.
BUTYLATE	2	0	0	2	0	0	.	.	.	.	.	.
*TOTAL SCAN SPECIFIC PESTICIDES	57	0	0	57	0	0	5	0	0	4	0	0
VOLATILES												
BENZENE	6	0	1	6	0	1	5	0	2	4	0	0
TOLUENE	6	0	1	6	0	2	5	0	3	4	0	1
ETHYLBENZENE	6	0	0	6	0	2	5	0	2	4	0	2
P-XYLENE	6	0	0	6	0	0	5	0	0	4	0	0
M-XYLENE	6	0	0	6	0	0	5	0	0	4	1	0
O-XYLENE	6	0	0	6	0	0	5	0	0	4	1	0
STYRENE	6	0	0	6	0	1	5	0	2	4	0	2
1,1 DICHLOROETHYLENE	6	0	0	6	0	0	5	0	0	4	0	0
METHYLENE CHLORIDE	6	0	0	6	0	0	5	0	0	4	0	0
T1,2DICHLOROETHYLENE	6	0	0	6	0	0	5	0	0	4	0	0
1,1 DICHLOROETHANE	6	0	0	6	0	0	5	0	0	4	0	0
CHLOROFORM	6	0	0	6	6	0	5	5	0	4	4	0
111, TRICHLOROETHANE	6	0	0	6	0	0	5	0	1	4	0	0
1,2 DICHLOROETHANE	6	0	0	6	0	0	5	0	0	4	0	0
CARBON TETRACHLORIDE	6	0	0	6	0	0	5	0	1	4	0	1
1,2 DICHLOROPROPANE	6	0	0	6	0	0	5	0	0	4	0	0
TRICHLOROETHYLENE	6	0	0	6	0	0	5	0	0	4	0	0
DICHLOROBROMOMETHANE	6	0	0	6	6	0	5	5	0	4	4	0
112 TRICHLOROETHANE	6	0	0	6	0	0	5	0	0	4	0	0
CHLORODIBROMOMETHANE	6	0	0	6	6	0	5	5	0	4	4	0
T-CHLOROETHYLENE	6	0	0	6	0	0	5	0	1	4	0	0
BROMOFORM	6	0	0	6	0	6	5	0	5	4	0	4
1122 T-CHLOROETHANE	6	0	0	6	0	0	5	0	0	4	0	0
CHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0
1,4 DICHLOROBENZENE	6	0	0	6	0	0	5	0	3	4	0	1
1,3 DICHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0
1,2 DICHLOROBENZENE	6	0	0	6	0	0	5	0	0	4	0	0
ETHLYENE DIBROMIDE	6	0	0	6	0	0	5	0	0	4	0	0
TOTL TRIHALOMETHANES	6	0	0	6	6	0	5	5	0	4	4	0
*TOTAL SCAN VOLATILES	174	0	2	174	24	12	145	20	20	116	18	11
*TOTAL GROUP ORGANIC	632	3	15	645	29	25	342	20	24	278	19	16

KEY TO TABLE 5 and 6

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
2. Interim Maximum Acceptable Concentration (IMAC)
3. Aesthetic Objective (AO)
3*. AO for Total Xylenes
4. Recommended Operational Guideline

B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO)

C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria
4T. EPA Ambient Water Quality Criteria for Total PAH

F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurement Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!IV	No Data: Inverted Septum
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant

UCR		Unreliable: Could Not Confirm By Reanalysis
UCS		Unreliable: Contamination Suspected
UIN		Unreliable: Indeterminate Interference
XP		Positive After X Number Of Hours
T#	(T06)	Result Taken After # Hours

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
BACTERIOLOGICAL						
FECAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0	GUIDELINE = 0 (A1)		
JAN	12	.	.	.	.	.
MAR	BDL	.	.	.	.	.
MAY	4	.	.	.	.	.
JUL	7	.	.	.	.	.
SEP	29	.	.	.	.	.
NOV	17	.	.	.	.	.
STANDRD PLATE CNT MF (COUNT/ML)			DET'N LIMIT = 0	GUIDELINE = 500/ML (A3)		
JAN	.	2 <=>	.	.	.	16
MAR	.	2 <=>	.	0 <=>	.	18
MAY	.	1 <=>	.	440	.	.
JUL	.	60	.	.	.	11
SEP	.	1 <=>	.	1 <=>	.	.
NOV	.	3 <=>	.	1 <=>	.	19
TOTAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0	GUIDELINE = 5/100ML(A1)		
JAN	110	.	.	.	.	.
MAR	100	.	.	.	.	.
MAY	90 <=>	.	.	.	.	.
JUL	150	.	.	.	.	.
SEP	180	.	.	.	.	.
NOV	180	.	.	.	.	.
T COLIFORM BCKGRD MF (CT/100ML)			DET'N LIMIT = 0	GUIDELINE = N/A		
JAN	540	.	.	.	.	.
MAR	424	.	.	.	.	.
MAY	1900	.	.	.	.	.
JUL	13000	.	.	.	.	.
SEP	18000	.	.	.	.	.
NOV	1600	.	.	.	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
CHEMISTRY (FLD)						
FLD CHLORINE (COMB) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A		
JAN	.	.880	.200	.400	.200	.300
MAR	.	.950	.300	.400	.500	.300
MAY	.	1.000	.050	.100	.	.
JUL	.	.700	.050	.200	.200	.300
SEP	.	.350	.100	.600	.	.
NOV	.	1.000	.100	.100	.500	.700
FLD CHLORINE FREE (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A		
JAN	.	.100	.100	.100	.100	.300
MAR	.	.050	.100	.100	.100	.400
MAY	.	.100	.100	.100	.	.
JUL	.	.300	.250	.100	.100	.200
SEP	.	1.400	.200	.100	.	.
NOV	.	.000	.200	.200	.100	.100
FLD CHLORINE (TOTAL) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A		
JAN	.	.980	.300	.500	.300	.600
MAR	.	1.000	.400	.500	.600	.700
MAY	.	1.100	.150	.200	.	.
JUL	.	1.000	.300	.300	.300	.500
SEP	.	1.750	.300	.700	.	.
NOV	.	1.000	.300	.300	.600	.800
FLD PH (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)		
JAN	7.880	7.440	7.400	7.400	7.600	7.600
MAR	7.500	7.100	7.500	7.300	7.600	7.400
MAY	8.100	7.200	7.400	7.200	.	.
JUL	7.800	7.010	7.400	7.200	7.400	7.400
SEP	7.750	7.400	7.500	7.500	.	.
NOV	8.000	7.700	7.400	7.400	7.600	7.600
FLD TEMPERATURE (DEG.C)			DET'N LIMIT = N/A	GUIDELINE = 15 (A3)		
JAN	7.000	7.000	17.000	6.000	12.000	5.000
MAR	2.500	2.000	16.000	4.000	10.000	4.000
MAY	7.500	7.000	17.000	9.000	.	.
JUL	13.000	13.000	18.000	13.000	15.000	12.000
SEP	20.000	20.000	22.500	19.000	.	.
NOV	9.000	8.000	18.500	11.500	16.000	11.000
FLD TURBIDITY (FTU)			DET'N LIMIT = N/A	GUIDELINE = 1 (A1)		
JAN	4.100	.220	.390	.340	.320	.240
MAR	5.000	.130	.170	.140	.150	.180
MAY	1.000	.110	.200	.170	.	.
JUL	1.400	.800	.400	.320	.340	.310
SEP	3.800	.350	.280	.280	.	.
NOV	2.900	.140	.200	.180	.260	.220

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
CHEMISTRY (LAB)						
ALKALINITY (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A3)		
JAN	104.700	95.000	93.600	93.900	97.300	97.100
MAR	103.100	93.500	95.300	93.900	94.300	94.300
MAY	101.500	90.800	92.800	93.700	.	.
JUL	!IS	94.600	92.900	94.100	90.600	92.900
SEP	94.300	86.800	90.200	88.800	.	.
NOV	103.400	95.800	95.700	94.900	96.800	96.800
CALCIUM (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 100 (F2)		
JAN	41.000	40.400	44.500	43.300	40.400	40.700
MAR	41.800	43.900	43.900	45.100	44.100	44.100
MAY	39.000	39.500	40.300	40.300	.	.
JUL	41.000	40.200	40.400	41.400	41.400	42.000
SEP	38.000	38.400	39.200	38.600	.	.
NOV	41.000	41.500	43.600	42.800	40.100	41.000
CHLORIDE (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 250 (A3)		
JAN	37.900	41.000	35.700	37.000	35.900	34.900
MAR	29.900	32.600	35.400	33.200	31.600	31.900
MAY	24.800	27.200	29.000	28.600	.	.
JUL	24.500	28.200	26.800	26.400	27.500	27.400
SEP	22.200	25.200	25.400	24.700	.	.
NOV	25.200	26.500	27.400	27.700	25.100	24.900
COLOUR (HZU)			DET'N LIMIT = 0.5	GUIDELINE = 5 (A3)		
JAN	2.000 <T	1.000 <T	1.000 <T	1.000 <T	1.000 <T	1.000 <T
MAR	.500 <T	BDL	.500 <T	1.000 <T	.500 <T	.500 <T
MAY	2.000 <T	.500 <T	.500 <T	.500 <T	.	.
JUL	2.000 <T	.500 <T	.500 <T	.500 <T	.500 <T	1.000 <T
SEP	.500 <T	.500 <T	.500 <T	.500 <T	.	.
NOV	2.000 <T	1.000 <T	.500 <T	1.000 <T	1.500 <T	1.000 <T
CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1.	GUIDELINE = 400 (F2)		
JAN	390	397	373	376	381	378
MAR	357	364	373	367	360	361
MAY	336	342	350	349	.	.
JUL	!IS	340	337	335	381	342
SEP	312	318	322	320	.	.
NOV	340	343	350	350	345	345
DISS ORG CARBON (MG/L)			DET'N LIMIT = .100	GUIDELINE = 5.0 (A3)		
JAN	1.700	1.700	1.700	1.800	1.800	1.700
MAR	1.800	1.600	1.900	1.500	1.900	1.600
MAY	2.100	2.000	2.000	2.000	.	.
JUL	2.100	2.000	1.800	2.300	2.100	2.000
SEP	2.200	2.000	2.000	1.800	.	.
NOV	1.800	1.600	1.700	1.800	2.200	1.900

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
FLUORIDE (MG/L)			DET'N LIMIT = 0.01	GUIDELINE = 2.4 (A1)		
JAN	.220	1.640	1.020	1.040	1.200	1.220
MAR	.140	1.260	1.160	1.180	1.160	1.160
MAY	.120	1.320	1.180	1.120	.	.
JUL	.120	.920	1.000	.820	1.040	1.040
SEP	.120	1.100	1.020	1.060	.	.
NOV	.180	.180	1.060	1.020	1.060	1.020
HARDNESS (MG/L)			DET'N LIMIT = 0.5	GUIDELINE = 80-100 (A4)		
JAN	138.400	136.600	146.700	143.700	135.800	137.000
MAR	139.200	144.100	145.600	149.100	147.600	147.200
MAY	131.200	132.900	135.800	135.200	.	.
JUL	139.000	137.000	136.000	140.000	141.000	141.000
SEP	130.000	131.000	132.700	130.700	.	.
NOV	137.500	138.100	145.000	142.000	136.500	139.000
IONCAL (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A		
JAN	.671	.702	5.694	2.851	1.495	.222
MAR	.299	4.027	3.365	6.333	6.407	5.118
MAY	4.663	2.595	1.163	1.768	.	.
JUL	.000	.036	1.774	2.880	5.076	3.764
SEP	.429	2.202	.627	.251	.	.
NOV	4.309	.508	3.204	1.510	1.946	.142
LANGELIERS INDEX (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A		
JAN	.463	.383	.541	.590	.385	.428
MAR	.468	.176	.323	.339	.382	.272
MAY	.473	.269	.327	.321	.	.
JUL	.	.455	.339	.426	-.245	.326
SEP	.432	.240	.425	.442	.	.
NOV	.482	.404	.434	.472	.493	.463
MAGNESIUM (MG/L)			DET'N LIMIT = 0.1	GUIDELINE = 30 (F2)		
JAN	8.750	8.650	8.650	8.650	8.500	8.650
MAR	8.450	8.400	8.750	8.850	9.100	9.000
MAY	8.250	8.350	8.550	8.400	..	.
JUL	8.900	8.900	8.700	8.800	9.000	8.800
SEP	8.400	8.500	8.450	8.340	.	.
NOV	8.500	8.400	8.700	8.600	8.800	8.900
SODIUM (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 200 (A4)		
JAN	23.100	22.600	19.200	19.400	19.800	19.400
MAR	17.200	17.300	18.600	17.600	16.900	16.600
MAY	12.700	12.800	14.100	13.700	.	.
JUL	13.800	13.800	13.600	13.200	13.800	13.800
SEP	11.800	12.000	11.500	11.600	.	.
NOV	11.700	12.500	13.800	13.400	12.400	12.300

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002	GUIDELINE = 0.05 (F2)		
JAN	.078	.150	.054	.060	.038	.014
MAR	.042	.188	.124	.030	.094	.094
MAY	.024	.084	.004 <T	.004 <T	.	.
JUL	.058	.084	.056	.026	.008 <T	BDL
SEP	BDL	BDL	.138	.106	.	.
NOV	.020	.220	.092	.034	.086	.072
NITRITE (MG/L)			DET'N LIMIT = 0.001	GUIDELINE = 1 (A1)		
JAN	.011	.003 <T	.002 <T	.001 <T	.002	.001
MAR	.008	.001 <T	.008	.003 <T	.002 <T	.001 <T
MAY	.006	.001 <T	.001 <T	BDL	.	.
JUL	.015	.004 <T	.002 <T	.002 <T	.006	.006
SEP	.001 <T	.001 <T	.003 <T	.004 <T	.	.
NOV	.008	.001 <T	.003 <T	.001 <T	.002 <T	.001 <T
TOTAL NITRATES (MG/L)			DET'N LIMIT = 0.005	GUIDELINE = 10 (A1)		
JAN	.455	.470	.440	.455	.465	.455
MAR	.470	.475	.505	.480	.470	.465
MAY	.385	.400	.385	.380	.	.
JUL	.355	.365	.360	.360	.355	.350
SEP	.335	.270	.300	.315	.	.
NOV	.410	.400	.430	.430	.405	.395
NITROGEN TOT KJELD (MG/L)			DET'N LIMIT = 0.02	GUIDELINE = N/A		
JAN	.360	.340	.230	.240	.240	.190
MAR	.300	.320	.350	.210	.260	.260
MAY	.420	.360	.180	.180	.	.
JUL	!IS	.310	.280	.420	.230	.220
SEP	.300	.180	.340	.300	.	.
NOV	.290	.350	.330	.250	.280	.450
PH (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)		
JAN	8.280	8.250	8.370	8.430	8.240	8.280
MAR	8.280	8.010	8.150	8.160	8.210	8.100
MAY	8:320	8.160	8.200	8.190	.	.
JUL	!IS	8.320	8.210	8.280	7.630	8.180
SEP	8.320	8.160	8.320	8.350	.	.
NOV	8.300	8.250	8.260	8.310	8.350	8.310
PHOSPHORUS FIL REACT (MG/L)			DET'N LIMIT = 0.0005	GUIDELINE = N/A		
JAN	.001 <T	.000 <T	.	.	.	.
MAR	.001 <T	.000 <T	.	.	.	.
MAY	.001 <T	.002	.	.	.	.
JUL	.000 <T	.001 <T	.	.	.	.
SEP	.002 <T	BDL	.	.	.	.
NOV	.003	.002 <T	.	.	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
PHOSPHORUS TOTAL (MG/L)			DET'N LIMIT = 0.002	GUIDELINE = .40 (F2)		
JAN	.023	.006 <T	.	.	.	.
MAR	.018	BDL	.	.	.	.
MAY	.019	.004 <T	.	.	.	.
JUL	!IS	.004 <T	.	.	.	.
SEP	.030	.008 <T	.	.	.	.
NOV	.025	.007 <T	.	.	.	.
SULPHATE (MG/L)			DET'N LIMIT = .200	GUIDELINE = 500 (A3)		
JAN	29.110	31.580	31.560	31.810	30.790	30.570
MAR	27.990	32.840	32.030	32.410	31.610	32.310
MAY	27.380	33.280	31.960	31.170	.	.
JUL	27.350	30.350	30.250	29.740	30.300	30.760
SEP	26.460	29.010	28.790	29.820	.	.
NOV	28.230	31.040	32.280	32.050	31.740	31.520
TURBIDITY (FTU)			DET'N LIMIT = 0.05	GUIDELINE = 1 (A1)		
JAN	6.400	.280	.210 <T	.730	.680	.280
MAR	4.400	.440	.680	.420	.410	.390
MAY	2.500	.600	.450	.540	.	.
JUL	3.000	.320	.560	.320	.500	.920
SEP	6.700	.350	.760	.590	.	.
NOV	2.500	.600	.430	.470	.750	.710

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
METALS						
SILVER (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 50 (A1)		
JAN	BDL	BDL	BDL	BDL	BDL	BDL
MAR	BDL	.060 <T	BDL	BDL	.060 <T	.060 <T
MAY	BDL	BDL	.060 <T	BDL	.	.
JUL	BDL	BDL	BDL	BDL	BDL	BDL
SEP	BDL	BDL	BDL	BDL	.	.
NOV	BDL	BDL	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 100 (A4)		
JAN	54.000	51.000	62.000	63.000	59.000	54.000
MAR	52.000	49.000	40.000	46.000	55.000	54.000
MAY	25.000	89.000	85.000	97.000	.	.
JUL	17.000	110.000	140.000	120.000	110.000	110.000
SEP	69.000	230.000	180.000	200.000	.	.
NOV	72.000	88.000	67.000	65.000	100.000	91.000
ARSENIC (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)		
JAN	.530 <T	.660 <T	.410 <T	.400 <T	.520 <T	.570 <T
MAR	.650 <T	.620 <T	.400 <T	.400 <T	.550 <T	.690 <T
MAY	.740 <T	.740 <T	.550 <T	.670 <T	.	.
JUL	.750 <T	.600 <T	.550 <T	.460 <T	.680 <T	.670 <T
SEP	.850 <T	.610 <T	.750 <T	.520 <T	.	.
NOV	.540 <T	.570 <T	BDL	.110 <T	.420 <T	.410 <T
BARIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)		
JAN	25.000	23.000	24.000	25.000	23.000	23.000
MAR	25.000	22.000	21.000	22.000	23.000	23.000
MAY	24.000	23.000	23.000	23.000	.	.
JUL	23.000	22.000	21.000	22.000	22.000	22.000
SEP	25.000	24.000	23.000	23.000	.	.
NOV	24.000	22.000	23.000	23.000	23.000	22.000
BORON (UG/L)			DET'N LIMIT = 2.00	GUIDELINE = 5000 (A1)		
JAN	28.000	27.000	29.000	30.000	34.000	28.000
MAR	28.000	27.000	32.000	29.000	29.000	28.000
MAY	62.000	58.000	36.000	61.000	.	.
JUL	30.000	27.000	25.000	24.000	30.000	31.000
SEP	26.000	25.000	25.000	24.000	.	.
NOV	33.000	31.000	29.000	30.000	27.000	25.000
CADMIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)		
JAN	BDL	BDL	BDL	.060 <T	BDL	BDL
MAR	.060 <T	BDL	.110 <T	.090 <T	.090 <T	.090 <T
MAY	BDL	BDL	BDL	BDL	.	.
JUL	BDL	BDL	BDL	BDL	BDL	BDL
SEP	BDL	BDL	BDL	BDL	.	.
NOV	BDL	.080 <T	BDL	BDL	BDL	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
COBALT (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = N/A		
JAN	.130 <T	.150 <T	.100 <T	.090 <T	.140 <T	.070 <T
MAR	.130 <T	.080 <T	.100 <T	.030 <T	.080 <T	.100 <T
MAY	.180 <T	.180 <T	.140 <T	.150 <T	.	.
JUL	.100 <T	.220 <T	.190 <T	.060 <T	.180 <T	.070 <T
SEP	.240 <T	.100 <T	BDL	.060 <T	.	.
NOV	.130 <T	.040 <T	.040 <T	.040 <T	.050 <T	.060 <T
CHROMIUM (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 50 (A1)		
JAN	.980 <T	.580 <T	.600 <T	.670 <T	1.700 <T	1.100 <T
MAR	.960 <T	1.100 <T	.610 <T	.740 <T	1.100 <T	.970 <T
MAY	2.300 <T	2.200 <T	1.100 <T	2.500 <T	.	.
JUL	1.900 <T	.770 <T	.810 <T	.740 <T	2.400 <T	2.600 <T
SEP	.600 <T	BDL	BDL	.510 <T	.	.
NOV	2.100 <T	1.700 <T	.840 <T	1.700 <T	.580 <T	.560 <T
COPPER (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 1000 (A3)		
JAN	200.000	4.300 <T	23.000	10.000	21.000	2.700 <T
MAR	18.000	1.800 <T	120.000	14.000	6.500	6.400
MAY	16.000	1.300 <T	36.000	12.000	.	.
JUL	38.000	1.700 <T	31.000	16.000	20.000	2.500 <T
SEP	59.000	6.300	26.000	11.000	.	.
NOV	37.000	2.900 <T	29.000	10.000	9.600	2.300 <T
IRON (UG/L)			DET'N LIMIT = 6.00	GUIDELINE = 300 (A3)		
JAN	98.000	BDL	BDL	BDL	BDL	BDL
MAR	78.000	6.600 <T	6.500 <T	BDL	6.500 <T	12.000 <T
MAY	32.000 <T	BDL	6.900 <T	BDL	.	.
JUL	35.000 <T	8.700 <T	11.000 <T	BDL	BDL	BDL
SEP	140.000	8.900 <T	BDL	11.000 <T	.	.
NOV	140.000	BDL	BDL	BDL	BDL	BDL
MERCURY (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = 1 (A1)		
JAN	.020 <T	.020 <T	.	.	.	.
MAR	BDL	BDL	.	.	.	.
MAY	BDL	BDL	.	.	.	.
JUL	BDL	BDL	.	.	.	.
SEP	BDL	BDL	.	.	.	.
NOV	.050 <T	BDL	.	.	.	.
MANGANESE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 50 (A3)		
JAN	5.400	.670	.780	.770	.720	.530
MAR	6.900	.770	.710	.830	.890	.870
MAY	3.600	.360 <T	.780	.630	.	.
JUL	5.600	1.100	1.400	1.100	1.100	.890
SEP	12.000	.840	.990	.810	.	.
NOV	8.600	.520	.660	.630	1.000	.860

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A		
JAN	1.100	1.200	1.400	1.400	1.200	1.200
MAR	1.100	1.200	1.300	1.300	1.200	1.200
MAY	1.100	1.200	1.200	1.200	.	.
JUL	1.100	1.300	1.300	1.300	1.200	1.300
SEP	1.100	1.400	1.300	1.600	.	.
NOV	1.100	1.300	1.300	1.300	1.300	1.300
NICKEL (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 350 (D3)		
JAN	.580 <T	.750 <T	1.000 <T	1.600 <T	1.500 <T	.710 <T
MAR	.680 <T	.740 <T	BDL	BDL	1.800 <T	1.400 <T
MAY	.960 <T	1.100 <T	1.200 <T	1.100 <T	.	.
JUL	1.300 <T	.860 <T	.770 <T	1.400 <T	1.100 <T	.630 <T
SEP	.380 <T	BDL	.320 <T	.900 <T	.	.
NOV	.720 <T	.550 <T	.460 <T	.520 <T	.830 <T	.600 <T
LEAD (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 10. (A1)		
JAN	1.100	BDL	.930	.330 <T	2.300	BDL
MAR	.730	.080 <T	5.000	.330 <T	.630	.640
MAY	.540	.070 <T	2.200	.540	.	.
JUL	.410 <T	.120 <T	1.800	.830	1.800	.270 <T
SEP	1.000	.110 <T	2.100	.660	.	.
NOV	.940	BDL	1.700	.380 <T	1.300	.260 <T
ANTIMONY (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 146 (D4)		
JAN	.500 <T	.520	.690	.580	.500 <T	.530
MAR	.630	.630	.630	.570	.560	.510
MAY	.620	.580	.700	.690	.	.
JUL	.610	.650	.770	.760	.580	.570
SEP	.640	.470 <T	.660	.640	.	.
NOV	.570	.520	.550	.530	.540	.440 <T
SELENIUM (UG/L)			DET'N LIMIT = 1.00	GUIDELINE = 10 (A1)		
JAN	1.100 <T	1.700 <T	BDL	BDL	2.100 <T	BDL
MAR	BDL	BDL	BDL	BDL	BDL	BDL
MAY	BDL	1.400 <T	BDL	1.400 <T	.	.
JUL	BDL	1.500 <T	BDL	2.000 <T	1.500 <T	BDL
SEP	BDL	BDL	BDL	BDL	.	.
NOV	BDL	BDL	BDL	BDL	BDL	BDL
STRONTIUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = N/A		
JAN	180.000	170.000	190.000	190.000	170.000	180.000
MAR	190.000	190.000	190.000	190.000	180.000	180.000
MAY	170.000	170.000	170.000	170.000	.	.
JUL	170.000	160.000	170.000	170.000	170.000	170.000
SEP	180.000	180.000	180.000	180.000	.	.
NOV	180.000	180.000	180.000	180.000	180.000	180.000

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	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
TITANIUM (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = N/A		
JAN	4.800 <T	3.700 <T	3.500 <T	3.200 <T	3.600 <T	3.300 <T
MAR	4.400 <T	4.100 <T	4.700 <T	4.400 <T	4.800 <T	5.000 <T
MAY	4.800 <T	5.100	5.400	5.500	.	.
JUL	3.800 <T	4.300 <T	4.500 <T	4.100 <T	4.300 <T	4.100 <T
SEP	4.300 <T	3.900 <T	3.700 <T	3.600 <T	.	.
NOV	3.000 <T	2.300 <T	2.300 <T	2.300 <T	2.400 <T	2.300 <T
URANIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 100 (A1)		
JAN	.340 <T	.320 <T	.350 <T	.360 <T	.390 <T	.350 <T
MAR	.300 <T	.310 <T	.460 <T	.290 <T	.300 <T	.270 <T
MAY	.340 <T	.280 <T	.320 <T	.300 <T	.	.
JUL	.280 <T	.330 <T	.270 <T	1.200	.340 <T	.290 <T
SEP	.410 <T	.350 <T	.360 <T	.360 <T	.	.
NOV	.390 <T	.320 <T	.330 <T	.320 <T	.330 <T	.300 <T
VANADIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A		
JAN	.450 <T	.530	.440 <T	.490 <T	.540	.480 <T
MAR	.380 <T	.670	.670	.650	.720	.680
MAY	.280 <T	.510	.530	.520	.	.
JUL	.240 <T	.410 <T	.400 <T	.420 <T	.390 <T	.400 <T
SEP	.300 <T	.210 <T	.250 <T	.240 <T	.	.
NOV	.280 <T	.150 <T	.120 <T	.150 <T	.140 <T	.110 <T
ZINC (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)		
JAN	12.000	.930 <T	4.300	2.700	31.000	.540 <T
MAR	8.400	2.700	32.000	2.700	11.000	9.800
MAY	5.500	2.200	11.000	2.400	.	.
JUL	4.300	3.100	8.900	6.500	24.000	2.900
SEP	8.700	2.800	16.000	2.500	.	.
NOV	8.000	2.200	11.000	2.900	23.000	2.700

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
CHLOROAROMATICS						
HEXACHLOROETHANE (NG/L)			DET'N LIMIT = 1.000		GUIDELINE = 1900 (D4)	
JAN	BDL	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	BDL	.	BDL
MAY	BDL	BDL	.	BDL	.	.
JUL	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	.
NOV	BDL	46.000	.	!SM	.	42.000

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	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
POLYAROMATIC HYDROCARBONS (PAH)						
BENZO(K) FLUORANTHEN (NG/L)			DET'N LIMIT = 1.		GUIDELINE = N/A	
JAN	BDL	BDL	.	.	.	.
MAR	BDL	BDL	.	.	.	.
MAY	BDL	BDL	.	.	.	.
JUL	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	.	.	.
NOV	BDL	1.000 <T	.	.	.	.

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	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
PESTICIDES & PCB						
ALPHA BHC (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 700 (G)		
JAN	1.000 <T	2.000 <T	.	2.000 <T	.	2.000 <T
MAR	2.000 <T	2.000 <T	.	1.000 <T	.	2.000 <T
MAY	2.000 <T	2.000 <T	.	2.000 <T	.	.
JUL	1.000 <T	2.000 <T	.	BDL	.	1.000 <T
SEP	1.000 <T	2.000 <T	.	1.000 <T	.	.
NOV	2.000 <T	2.000 <T	.	!SM	.	2.000 <T
LINDANE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 4000 (A1)		
JAN	1.000 <T	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	BDL	.	BDL
MAY	BDL	BDL	.	BDL	.	.
JUL	3.000 <T	3.000 <T	.	BDL	.	1.000 <T
SEP	BDL	BDL	.	BDL	.	.
NOV	BDL	BDL	.	!SM	.	BDL
ATRAZINE (NG/L)			DET'N LIMIT = 50	GUIDELINE = 60000 (A2)		
JAN	BDL	BDL	.	.	.	.
MAR	100.000 <T	150.000 <T	.	.	.	.
MAY	!LA	BDL	.	.	.	.
JUL	BDL	BDL	.	.	.	.
SEP	BDL	BDL	.	.	.	.
NOV	150.000 <T	140.000 <T	.	.	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
PHENOLICS (UG/L PHENOLICS)			DET'N LIMIT = .20	GUIDELINE = 2 (A4)		
JAN	1.600	2.800	.	.	.	.
MAR	BDL	.600 <T	.	.	.	.
MAY	BDL	.400 <T	.	.	.	.
JUL	.600 <T	1.400	.	.	.	.
SEP	.600 <T	1.000 <T	.	.	.	.
NOV	.600 <T	BDL	.	.	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
VOLATILES						
BENZENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)		
JAN	BDL	BDL	.	BDL	.	BDL
MAR	BDL	.100 <T	.	!U	.	BDL
MAY	BDL	BDL	.	.050 <T	.	.
JUL	BDL	BDL	.	BDL	.	BDL
SEP	.050 <T	BDL	.	.050 <T	.	.
NOV	BDL	BDL	.	BDL	.	BDL
TOLUENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 24 (A3)		
JAN	BDL	.050 <T	.	BDL	.	BDL
MAR	BDL	BDL	.	!U	.	BDL
MAY	BDL	BDL	.	.100 <T	.	.
JUL	BDL	BDL	.	.150 <T	.	BDL
SEP	.050 <T	.050 <T	.	BDL	.	.
NOV	BDL	BDL	.	.150 <T	.	.150 <T
ETHYLBENZENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)		
JAN	BDL	BDL	.	BDL	.	BDL
MAR	BDL	.100 <T	.	!U	.	.100 <T
MAY	BDL	.100 <T	.	.050 <T	.	.
JUL	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	.
NOV	BDL	BDL	.	.050 <T	.	.350 <T
M-XYLENE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)		
JAN	BDL	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	!U	.	BDL
MAY	BDL	BDL	.	BDL	.	.
JUL	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	.
NOV	BDL	BDL	.	BDL	.	1.300
O-XYLENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 300 (A3*)		
JAN	BDL	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	!U	.	BDL
MAY	BDL	BDL	.	BDL	.	.
JUL	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	.
NOV	BDL	BDL	.	BDL	.	.750
STYRENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 100 (D1)		
JAN	BDL	BDL	.	BDL	.	BDL
MAR	BDL	.100 <T	.	!U	.	.050 <T
MAY	BDL	BDL	.	.050 <T	.	.
JUL	BDL	BDL	.	BDL	.	.050 <T
SEP	BDL	BDL	.	BDL	.	.
NOV	BDL	BDL	.	.100 <T	.	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
CHLOROFORM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)		
JAN	BDL	7.900	.	8.100	.	9.200
MAR	BDL	7.500	.	!U	.	7.800
MAY	BDL	7.700	.	8.800	.	.
JUL	BDL	8.500	.	7.200	.	8.300
SEP	BDL	26.000	.	12.200	.	.
NOV	BDL	7.100	.	9.300	.	8.900
111, TRICHLOROETHANE (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = 200 (D1)		
JAN	BDL	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	!U	.	BDL
MAY	BDL	BDL	.	.020 <T	.	.
JUL	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	.
NOV	BDL	BDL	.	BDL	.	BDL
CARBON TETRACHLORIDE (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 5 (A1)		
JAN	BDL	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	!U	.	BDL
MAY	BDL	BDL	.	BDL	.	.
JUL	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	.
NOV	BDL	BDL	.	.200 <T	.	.200 <T
DICHLORODBROMOMETHANE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)		
JAN	BDL	7.050	.	7.250	.	7.900
MAR	BDL	6.900	.	!U	.	6.900
MAY	BDL	6.900	.	7.250	.	.
JUL	BDL	7.100	.	6.200	.	6.500
SEP	BDL	13.550	.	8.150	.	.
NOV	BDL	6.900	.	7.150	.	7.050
CHLORODIBROMOMETHANE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)		
JAN	BDL	3.300	.	3.600	.	4.000
MAR	BDL	3.000	.	!U	.	3.100
MAY	BDL	3.200	.	3.500	.	.
JUL	BDL	2.700	.	2.900	.	2.800
SEP	BDL	5.700	.	4.000	.	.
NOV	BDL	4.100	.	2.800	.	3.400
T-CHLOROETHYLENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 5 (D1)		
JAN	BDL	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	!U	.	BDL
MAY	BDL	BDL	.	BDL	.	.
JUL	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	.050 <T	.	.
NOV	BDL	BDL	.	BDL	.	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM SOUTH PEEL (LAKEVIEW) WSS 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
BROMOFORM (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 350 (A1+)		
JAN	BDL	.400 <T	.	.600 <T	.	.600 <T
MAR	BDL	.400 <T	.	!U	.	.400 <T
MAY	BDL	.400 <T	.	.400 <T	.	.
JUL	BDL	.400 <T	.	.400 <T	.	.400 <T
SEP	BDL	.600 <T	.	.400 <T	.	.
NOV	BDL	.400 <T	.	.200 <T	.	.400 <T
1,4 DICHLOROBENZENE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 5 (A1)		
JAN	BDL	BDL	.	.100 <T	.	BDL
MAR	BDL	BDL	.	!U	.	BDL
MAY	BDL	BDL	.	BDL	.	.
JUL	BDL	BDL	.	.100 <T	.	.300 <T
SEP	BDL	BDL	.	.200 <T	.	.
NOV	BDL	BDL	.	BDL	.	BDL
TOTL TRIHALOMETHANES (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)		
JAN	BDL	18.750	.	19.450	.	21.600
MAR	BDL	17.750	.	!U	.	18.200
MAY	BDL	17.800	.	19.900	.	.
JUL	BDL	18.700	.	16.700	.	18.000
SEP	BDL	45.800	.	24.750	.	.
NOV	BDL	18.550	.	19.450	.	19.600

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
BACTERIOLOGICAL				
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0	(A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML	(A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A	
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML	(A1)
CHEMISTRY (FLD)				
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A	
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A	
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A	
FIELD PH	DMNSLESS	N/A	6.5-8.5	(A3)
FIELD TEMPERATURE	DEG.C	N/A	15.0	(A3)
FIELD TURBIDITY	FTU	N/A	1.0	(A1)
CHEMISTRY (LAB)				
ALKALINITY	MG/L	0.2	30-500	(A3)
AMMONIUM TOTAL	MG/L	0.002	0.05	(F2)
CALCIUM	MG/L	0.2	100	(F2)
CHLORIDE	MG/L	0.2	250	(A3)
COLOUR	TCU	0.5	5.0	(A3)
CONDUCTIVITY	UMHO/CM	1.0	400	(F2)
CYANIDE	MG/L	0.001	0.2	(A1)
DISSOLVED ORGANIC CARBON	MG/L	0.1	5.0	(A3)
FLUORIDE	MG/L	0.01	2.4	(A1)
HARDNESS	MG/L	0.5	80-100	(A4)
LANGELIERS INDEX	DMNSLESS	N/A	N/A	
MAGNESIUM	MG/L	0.1	30.0	(F2)
NITRITE	MG/L	0.001	1.0	(A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A	
PH	DMNSLESS	N/A	6.5-8.5	(A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A	
PHOSPHORUS TOTAL	MG/L	0.002	0.4	(F2)
SODIUM	MG/L	0.2	200	(A4)
SULPHATE	MG/L	0.2	500	(A3)
TOTAL NITRATES	MG/L	0.005	10.0	(A1)
TURBIDITY	FTU	0.05	1.0	(A1)
CHLOROAROMATICS				
123 TRICHLOROBENZENE	NG/L	5.0	N/A	
1234 TETRACHLOROBENZENE	NG/L	1.0	N/A	
1235 TETRACHLOROBENZENE	NG/L	1.0	N/A	
124 TRICHLOROBENZENE	NG/L	5.0	10000	(I)
1245-TETRACHLOROBENZENE	NG/L	1.0	38000	(D4)
135 TRICHLOROBENZENE	NG/L	5.0	N/A	
236 TRICHLOROTOLUENE	NG/L	5.0	N/A	
245 TRICHLOROTOLUENE	NG/L	5.0	N/A	
26A TRICHLOROTOLUENE	NG/L	5.0	N/A	
HEXACHLOROBENZENE	NG/L	1.0	10	(C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450	(D4)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000	(D4)
HEXACHLOROETHANE	NG/L	1.0	1900	(D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A	
PENTACHLOROBENZENE	NG/L	1.0	74000	(D4)
CHLOROPHENOLS				
234 TRICHLOROPHENOL	NG/L	100.0	N/A	
2345 TETRACHLOROPHENOL	NG/L	20.0	N/A	
2356 TETRACHLOROPHENOL	NG/L	10.0	N/A	

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
245 TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
246 TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	50 (A1)
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
PAH			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10.0 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000.0 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DES ETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
O,P-DDD	NG/L	5.0	10 (I)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	N/A
O,P-DDT	NG/L	5.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PPDDE	NG/L	1.0	30000 (A1)
PPDDT	NG/L	5.0	30000 (A1)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
D-ETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	2 (A4)
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000 (A1)
24-DICHLORORPHENOXYBUTYRIC ACID (24-DB)	NG/L	200.	18000 (B3)
BUTYLATE (SUTAN)	NG/L	2000.	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.	90000 (A1)
CARBOFURAN	NG/L	2000.	90000 (A1)
CHLORPYRIFOS (DURSBAN)	NG/L	20.	N/A
CICP (CHLORPROPHAM)	NG/L	2000.	350000 (G)
DIALLATE	NG/L	2000.	N/A
DIAZINON	NG/L	20.	20000 (A1)
DICAMBA	NG/L	50.	120000 (A1)
DICHLOROVOS	NG/L	20.	N/A
EPTAM	NG/L	2000.	N/A
ETHION	NG/L	20.	35000 (G)
IPC	NG/L	2000.	N/A
MALATHION	NG/L	20.	190000 (A1)
METHYL PARATHION	NG/L	50.	7000 (B3)
METHYLTRITHION	NG/L	20.	N/A
MEVINPHOS	NG/L	20.	N/A
PARATHION	NG/L	20.	50000 (A1)
PHORATE (THIMET)	NG/L	20.	2000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.	140000 (D3)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
SILVEX (2,4,5-TP)	NG/L	20.	10000 (A1)
VOLATILES			
1,1 DICHLOROETHANE	UG/L	0.10	N/A
1,1 DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2 DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2 DICHLOROETHANE	UG/L	0.05	5 (A1)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
1,2 DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3 DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4 DICHLOROBENZENE	UG/L	0.10	5 (A1)
111, TRICHLOROETHANE	UG/L	0.02	200 (D1)
112 TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1122 TETRACHLOROETHANE	UG/L	0.05	0.17(D4)
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHLYENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	5 (D1)
TRANS 1,2 DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1990, 76 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment (MOE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY
All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;

ii/ the water being sampled is not being modified by the sampling system;

iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and

iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake,

discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

PARAMETER REFERENCE INFORMATION

BENZENE (B2001P) VOLATILES

CLASS: HEALTH METHOD: P0C0D0 UNIT: µg/L

SOURCE	FROM	TO	METHOD	GUIDELINE	UNIT	NOTE
CAL C	85/01			0.700	µg/L	AL
CDWG C	87/01			5.000	µg/L	MAC
EPA C	87/07			5.000	µg/L	MCL
EPAA C	80/11			6.600	µg/L	AMBIENT **
FERC C	84/05			1.000	µg/L	MCL
WHO C	84/01			10.000	µg/L	GV

DESCRIPTION:**NAME:** BENZENE
CAS#: 71-43-2
MOLECULAR FORMULAE: C_6H_6
DETECTION LIMIT: (FOR METHOD POCODO) 0.05 µg/L
SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27). CYCLOHEXATRIENE (41).
CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30).
PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41). THRESHOLD ODOUR: 0.5 - 10 PPM IN WATERTHRESHOLD TASTE: 0.5 mg/L IN WATER (39).
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80).
SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.
USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF

OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.

TOXICITY: RATING: 4 (VERY TOXIC).
ACUTE: IRRITATING TO MUCOUS MEMBRANES; SYMPTOMS INCLUDE RESTLESSNESS, CONVULSIONS, EXCITEMENT, DEPRESSION; DEATH MAY FOLLOW RESPIRATORY FAILURE.
CHRONIC: MAY CAUSE ANAEMIA AND LEUKAEMIA (45); MUTAGENIC.
MODE OF ACTION: CHROMOABERRATION IN LYMPHOCYTE CULTURES.

CARCINOGENICITY: A KNOWN HUMAN CARCINOGEN.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION

ADDITIONAL PROPERTIES:

MOLECULAR WEIGHT: 78.12
MELTING POINT: 5.5°C (27).
BOILING POINT: 80.1°C (27).
SPECIFIC GRAVITY: 0.8790 AT 20°C (27).
VAPOUR PRESSURE: 100 MM AT 26.1°C (27).
HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41).
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39).
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

NOTES: EPA PRIORITY POLLUTANT.

Appendix B

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (**Caution:** HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC),(OWTRI),(OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -when 'special pesticides' are requested three extra bottles must be filled
Cyanide	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (**Caution:** NaOH is corrosive)

Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid (HNO_3) and potassium dichromate ($K_2Cr_2O_7$) (**Caution:** HNO_3&$K_2Cr_2O_7$ are corrosive)
Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

<u>Steps:</u>

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top

Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (**Caution:** HNO_3 is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid HNO_3 (**Caution:** HNO_3 is corrosive)

Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do not rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC) (OAPAHX)	-1 L amber glass bottle per scan -do not rinse bottle -fill to 2 cm from top

Steps:

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.